Name: Date:

Polynomial Factoring solution (version 600)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 112}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-96}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{6}\, i}{2}$$

$$x = -2 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 3i$ and $-5 - 4i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 3i) \cdot (-5 - 4i)$$

$$45 + 36i - 15i - 12i^2$$

$$45 + 36i - 15i + 12$$

$$45 + 12 + 36i - 15i$$

$$57 + 21i$$

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3. **Write function $f(x) = x^3 - 5x^2 - 8x + 12$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-5	-8	12
6		6	6	-12
	1	1	-2	0

$$f(x) = (x-6)(x^2+x-2)$$

$$f(x) = (x-6)(x-1)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+3) \cdot (x-2)^2$$

Sketch a graph of polynomial $y = p(x)$.